



# COMPUTER CENTRE BULLETIN

*Vol. 5, No. 1*  
*10 January 1972*

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REVISION OF COMPUTER CENTRE CHARGES

[WN-70]

Over the past few years, it has been the policy of the Computer Centre to review and revise its schedule of charges annually. The review at the end of 1971 has now been made and the revised schedule is shown below. The new schedule of charges became effective on 4 January 1972.

In common with other sections of the community, the Computer Centre has had to meet increasing costs of providing its services. A review of the first year of operation of the timesharing service on the PDP-10 computer has shown a number of areas where the charging structure required rationalization (e.g. removal of file opening charges). Also, the charge schedule now includes rates for some new services introduced during 1971 and makes provision for the planned introduction of other services in 1972. It is estimated that the net result of these charges will be an average increase of 7½% in computer charges. More detailed information of the changes is given below.

This new charge schedule has been established in conjunction with long term budget planning for the Computer Centre. It is anticipated that over the next few years there will be no further major changes to this schedule. Future reviews should result only in minor variations in rates.

(a) PDP-10 Computer

| Item                               | Charge per   | Univ. *<br>Depts | Other<br>Users |
|------------------------------------|--------------|------------------|----------------|
| 1. PROCESSOR TIME AND MEMORY SPACE |              |                  |                |
| Processor time                     | minute       | 1.00             | 2.00           |
| Memory space                       | Kwords/min   | 0.12             | 0.24           |
| 2. INPUT/OUTPUT                    |              |                  |                |
| Card reading                       | Kword        | 0.06             | 0.12           |
| Card punching                      | Kword        | 0.60             | 1.20           |
| Paper tape reading **              | Kword        | 0.30             | 0.60           |
| Paper tape punching **             | Kword        | 0.60             | 1.20           |
| File I/O                           | Kword        | 0.015            | 0.03           |
| Plotting                           | Kword        | 0.15             | 0.30           |
| Line printing                      | Kword        | 0.08             | 0.16           |
| Remote I/O °                       | hour connect | 0.60             | 1.20           |
| 3. FILE STORAGE                    |              |                  |                |
| Storage °°                         | Kword/day    | 0.002            | 0.002          |
| 4. MINIMUM JOB CHARGE              |              |                  |                |
|                                    |              | 0.20             | 0.20           |

## 5. DEVICE SETUP \*\*

|                                              |      |      |
|----------------------------------------------|------|------|
| Setup of printer for non-standard stationery | 1.00 | 1.00 |
| Setup of digital plotter                     | 0.60 | 0.60 |
| Mounting removable disk pack                 | 1.00 | 1.00 |
| Mounting magnetic tapes                      | 0.40 | 0.40 |

## 6. CONSUMABLE ITEMS

|                     |              |       |       |
|---------------------|--------------|-------|-------|
| Standard stationery | 100 pgs est. | 0.50  | 0.50  |
| 2-part stationery   | pg est.      | 0.015 | 0.015 |
| 4-part stationery   | pg est.      | 0.035 | 0.035 |
| Special stationery  | cost         | cost  | cost  |

## 7. DEDICATED MODE SERVICE

|                         |      |        |        |
|-------------------------|------|--------|--------|
| Dedicated use of PDP-10 | hour | 150.00 | 300.00 |
|-------------------------|------|--------|--------|

DISCOUNT FOR LOW-PRIORITY BATCH PROCESSING

A 20% discount for low priority batch processing work, which would normally be processed overnight, will be available with the introduction of third shift operation.

\* University Departments, Administration and Services.  
This includes the Bookshop, University Colleges, Credit Union, Library, Photography, Printery and Union.

\*\* These charges will be applied when the requisite services become available.

o An additional charge of \$0.60 per hour is payable when a project authorized by a department is run from another department's terminal (not yet implemented).

oo This charge category will be revised with the introduction of a file management system allowing files to be archived to magnetic tape.

(b) GE-225 Computer

| Item               | Charge per | Univ. *<br>Depts | Other<br>Users |
|--------------------|------------|------------------|----------------|
| Computer system    | hour       | 21.50            | 120.00         |
| Magnetic tape hire | month      |                  |                |
| 1200 ft tapes      |            | 1.00             | 1.00           |
| 2400 ft tapes      |            | 2.00             | 2.00           |

(c) Data Preparation

| Item         | Charge per | Univ. *<br>Depts | Other<br>Users |
|--------------|------------|------------------|----------------|
| Keypunching  | hour       | 5.40             | 10.80          |
| Interpreting | hour       | 5.40             | 10.80          |
| Verifying    | hour       | 4.30             | 8.60           |

NEW MONITOR

[WN-70]

A new monitor was implemented on 4 January 1972. While most of the changes are not apparent to the user this monitor incorporates the new charge rates as outlined above, and should provide improved reliability of operation.

NEW VERSION OF COMPARE

[WN-69]

A new version of COMPARE (version 16) was implemented on 6 December 1971. This version allows for files from other directories to be compared, provided that the user is permitted to access these files.

COMPUTER CENTRE MANUALS

This year, Computer Centre manuals, coding sheets, flow-chart templates, etc. will be sold directly in the Computer Centre.

A revised list of manuals and supplies including prices for 1972 follows:

MANUALSSUPPLIES

|        |                                |        |                     |        |
|--------|--------------------------------|--------|---------------------|--------|
| MNT-5  | FORTTRAN                       | \$1-50 | CODING SHEETS       | \$0-50 |
| MNT-6  | EDITOR                         | \$0-80 | FLOWCHART TEMPLATES | \$1-00 |
| MNT-8  | SYSTEM USER'S<br>GUIDE         | \$3-60 | H.S.P. BINDERS      | \$1-10 |
| MNT-9  | BASIC                          | \$2-40 |                     |        |
| MNT-10 | AID                            | \$3-00 |                     |        |
| MNT-12 | s. 1,2 OVERLAYS<br>AND PLOTTER | \$0-90 |                     |        |
|        | s. 3 DDT-10                    | \$1-30 |                     |        |

COMPUTER CENTRE COURSES AND SEMINARS

During February 1972, the Computer Centre will conduct a number of courses and seminars. A schedule of these is set out on page 4. A complete schedule of Computer Centre courses for 1972 will be published at a later date when lecture room availability and allocation for the year becomes known.

SCHEDULE FOR FEBRUARY 1972

| Date    | Commence Time | Title                                       | Type    | Location | Course Duration                            | Course Fee |       | Nomina-<br>tion<br>Closing<br>Date |
|---------|---------------|---------------------------------------------|---------|----------|--------------------------------------------|------------|-------|------------------------------------|
|         |               |                                             |         |          |                                            | Univ.      | Other |                                    |
| 1.2.72  | 10 a.m.       | Computer Centre Facilities and Services     | Seminar | B18 Eng. |                                            |            |       |                                    |
| 3.2.72  | 10 a.m.       | Use of Remote Terminals                     | Seminar | B18 Eng. |                                            |            |       |                                    |
| 7.2.72  | 9 a.m.        | Introductory FORTRAN Programming            | Course  | B18 Eng. | 5 mornings<br>9 - 1 p.m.<br>7 - 11.2.72    | \$20       | \$40  | 31.1.72                            |
| 21.2.72 | 10 a.m.       | Use of Remote Terminals                     | Seminar | B18 Eng. |                                            |            |       |                                    |
| 22.2.72 | 10 a.m.       | The Digital Plotter                         | Seminar | B18 Eng. |                                            |            |       |                                    |
| 23.2.72 | 10 a.m.       | The Student Accounting System               | Seminar | B18 Eng. |                                            |            |       |                                    |
| 24.2.72 | 10 a.m.       | Absolute Overlays                           | Seminar | B18 Eng. |                                            |            |       |                                    |
| 24.2.72 | 2 p.m.        | Introduction to Dynamic Debugging Technique | Course  | B18 Eng. | 2 afternoons<br>2 - 5 p.m.<br>24 - 25.2.72 | \$8        | \$16  | 17.2.72                            |

MATHPAC/200

[WN-68]

The Computer Centre recently received, from Honeywell Information Systems, the source decks and a single manual for MATHPAC/200, whose contents are listed below. These routines are written in FORTRAN for the GE-200. The routines are not incorporated into the FORTRAN IV library, but source decks or listings could be made available. If sufficient interest is shown, further copies of the manual will be ordered, but in the meantime, the Centre will copy sections for interested users. For further information please contact the Administrative Officer, Mr Jauncey, on extension 8471.

The set of subprograms referred to as MATHPAC/200 consist of the following:

- Floating-Point Matrix Add Subroutine (MATA)
- Floating-Point Matrix Subtract Subroutine (MATB)
- Floating-Point Matrix Multiply Subroutine (MATM)
- Floating-Point Matrix Scalar Multiply Subroutine (MATS)
- Floating-Point Matrix Transpose Subroutine (MATT)
- Floating-Point Matrix Transpose Special Subroutine (MATTS)
- Floating-Point Matrix Invert Subroutine (MATI)
- Floating-Point Linear Simultaneous Equations Subroutine (SIMEQ)
- Eigenvalue/Eigenvector Subroutine (EIGENJ)
- Eigen Systems Subroutine (EIGENS)
- Floating-Point Polynomial Roots Subroutine (POLRTS)
- Lagrange Table Lookup and Interpolation Function Subprogram (ALAGRF)
- Least Squares Curve Fit Subroutine (FIT)
- Differential Equations Numerical Integration Subroutine (DIFFEQ)

There is one section in the manual for each subprogram, with each section giving a brief description of the purpose of the subprogram, together with a description of the manner in which the subprogram may be called in a user's main program.

More detailed information on each subroutine may be obtained by referring to the GE-400 series MATHPAC Application Handbook (CPB-1161).

STUDENT ACCOUNTING SYSTEM*Ian Burgess*1. INTRODUCTION

When a user wishes to run a large number of essentially independent jobs on the same project, it is not efficient to separate them with end-of-job, job

identification and job cards. Until now this has been necessary to separate the output of each and to ensure that no one job used more than a specified amount of money. To avoid this, and to enable the project owner to administer its use by a number of students, a Student Accounting System has been developed.

This system has been designed for running class exercises for students of computing, and provides the following features. Any user wishing to segment a job may well find these functions useful.

- (a) Simple setup of student jobs.
- (b) Ability to specify a cost limit to apply to each student job.
- (c) Cheaper computing, the minimum job charge of 20c applies to the whole job, not to each student job.
- (d) Separate output for each student job identified by both project owner and student names.
- (e) A file in a specified project area giving details of each student job processed. This file can be analyzed by the project owner.

The complete job is set up in the usual way, and with the exceptions of LIMIT(JOB) and SACS, any legal command may be used within a student job.

## 2. COMMANDS

Three commands are used in the Student Accounting System. For batch use commands are punched on cards starting in column 2 with the command symbol '.' in column 1. The same commands could be used from a terminal if desired.

### 2.1 SACS

Command format:

SACS {PROJECT={project, {NAME={name, {COST={cost

The SACS command allows the project owner to specify a cost limit to apply to each student job in a group. The limit of expenditure for each of the following student jobs will be \$1.00 unless a different amount is specified to the SACS command. The file of accounting information, 'SADAT', (updated by the QUIT command) may, for security, be created on an area other than the current job's area. If this is desired, the project number and the corresponding name is specified to the SACS command.

For further details of this command see the System User's Guide, section 6.4.31.

## 2.2 IDENT

Command format:

```
IDENT {NUMBER={number}, {NAME={name}, {EXERCISE={exercise}}
```

This command indicates the start of a Student Job, and identifies the output. The student should be identified by both name and a number less than 100000. A three digit exercise number may also be given. This information is printed on the first page of the student's output and stored for use by the QUIT command.

IDENT sets the cost limit given by the most recent SACS command, or \$1.00 if none, provided the balance of the job cost limit is greater than this. If the job balance is insufficient, no further work is undertaken.

Further details are given in the System User's Guide, section 6.4.26.

## 2.3 QUIT

Command format:

```
QUIT
```

The end of a Student Job is indicated by a QUIT command. This command has no options or arguments. It is implied by an IDENT but not by EOJ if QUIT is not specifically given.

QUIT outputs the terminating page which shows the cost of the student job. The cost is also printed for the project owner and the updated SADAT file includes the cost as well as identifying information.

Further details of QUIT, including error messages are given in the System User's Guide, section 6.4.30.

## 3. FORMAT OF BATCH OUTPUT

The output from a batch job which includes student jobs is segmented so that each student job has its own header and trailer pages. The name bands include both the project owner's and the student's names. On the header page, identifying information including the student name and number and the exercise number is printed, along with the cost limit and the date and time. The final name banded page gives the cost for the student job.

The output pertaining to the owner of the project is separate. Whenever, an IDENT command is processed, it is echoed for the owner. When a QUIT is processed the cost is output for the owner as well as for the student, so a

series of student jobs would produce a list of IDENT commands followed by the cost of each in addition to any other processing done by the owner.

4. STUDENT ACCOUNTING DATA FILE - SADAT

Information on the expenditure by each student job is recorded at each QUIT, whether explicit or implied, on a file in a user's area for use by the administrator of the project. The name of the file is 'SADAT' and the user area is that of the job project unless a SACS command specifies some other project. The file is protected at creation by QUIT against deletion or overwriting by giving read access to the owner only.

The project owner may change the permission of the file and TYPE or LIST it as it stands. Alternatively, it may be processed by a FORTRAN program. The structure of the file is as follows:

- Record 1            the number of records in the file, n, in I8 format.
- Record 2 - n+1 the student number, name (two words), cost in cents, spare, exercise number; in format (I5, 2A5, 2I5, I3).